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THE SEARCH FOR HEALTH

A Report from
The National Institutes of Health
Bethesda, Maryland

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Occupational Risk of Cancer From Pesticides: Farmer Studies

Studies from the United States and other countries have shown that farmers have a higher risk for certain cancers, particularly cancers of the blood and immune systems (leukemia, non-Hodgkin's lymphoma, and multiple myeloma). The reasons for the increased risks are not clear, and scientists are looking at chemical and other occupational exposures common to farming to identify the possible cause or causes.

Farmers are exposed to a variety of potentially harmful substances during their work day, including: pesticides (fungicides, herbicides, insecticides, rodenticides, and others), chemical solvents, fuels and oils, animal viruses, and other microbes. Some of these agents are known or suspected carcinogens.

In the 1980s, National Cancer Institutes (NCI) researchers began several studies comparing pesticides use by farmers with cancer to those without the disease. The first of these investigations was a study of Kansas farmers with soft-tissue sarcomas, Hodgkin's disease, and non-Hodgkin's lymphoma (NHL). This study showed that farmers who used herbicides, especially 2, 4-dichlorophenoxyacetic acid (2, 4-d), had an excess of NHL as compared to farmers and nonfarmers who did not use these chemicals.

The risk of developing NHL increased with frequency of herbicide use. Farmers who used herbicides on their farms 20 or more days per year had a six times greater risk of developing NHL than nonfarmers. Within the high exposure group, farmers who mixed and applied the herbicides themselves had an eight-fold greater risk. Soft-tissue sarcomas and Hodgkin's disease were not linked with use of herbicides.

NIH is an operating agency of the U.S. Department of Health and Human Servicees

Researchers studied 201 men living in 66 counties in eastern Nebraska who developed NHL between 1983 and 1986. Although there was no overall excess of NHL among farmers, farmers who mixed or applied 2,4-D had a 50 percent increased risk of the disease. The risk of NHL also increased with frequency of 2,4-D use. Researchers believe the evidence suggests that the use of 2,4-D in the agricultural setting increases the risk of NHL among persons handling this pesticide frequently.

Researchers studied a total of 578 cases of leukemia diagnosed among men in Iowa and Minnesota between 1981 and 1984 (293 cases in Iowa and 285 cases in Minnesota). To compare the effects of pesticide exposure, 1,245 men without the disease were selected at random from the general population.

The researchers found a slight excess of leukemia, especially chronic lymphocytic leukemia, among farmers. Exposure to specific fungicides, herbicides (including 2,4-D), or crop insecticides did not increase the risk.

The risk for leukemia was significantly elevated among farmers who used certain pesticides to inhibit insects on animals rather than on crops. Risk of leukemia did not increase consistently with how often any pesticide was used. However, the greatest risk among farmers using chlordane, DDT, dichlorvos, and malathion occurred among those using the chemicals on animals 10 or more days a year.

Researchers improved the accuracy of the risk estimate from individual pesticides by accounting for the cancer risk from smoking, nonfarming occupational and chemical exposures, family history of cancer, and other factors. Larger studies are still needed to fully evaluate the effects of any single pesticide on leukemia risk.

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